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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/745,780	12/21/2000	Martin C. Roberts	303.451US6	3144

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EXAMINER

BEREZNY, NEAL

ART UNIT PAPER NUMBER

2823

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Supplemental
Office Action Summary

Application No.

09/745,780

Applicant(s)

TANG ET AL.

Examiner

Neal Berezny

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38-45, 47-52, 54-59, 62-65 and 68-79 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 38-45, 47-52, 54-59, 62-65 and 68-79 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

Withdrawal of Finality

1. The terminal disclaimer filed on 1/3/03 was defective because the serial number of the application, which forms the basis of the terminal disclaimer, is incorrect. The terminal disclaimer is drawn to 09/351,884, which is an abandoned application, whereas the double patenting rejection is based on US patent 5,923,584, formerly 09/134,005. Consequently, the double patenting rejection made in the office action dated 9/27/02, paper 14, was not overcome by the terminal disclaimer and is now included in this final rejection. The previous final rejection, mailed 2/28/03, paper 16, is withdrawn and the time period for response is restarted with the mailing of the instant final rejection.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 38-45, 47-52, 54-59, 62-65, and 68-79 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 5,923,584. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious at the time of applicant's invention to one of ordinary skill in the art to employ the well known practice of employing resist to form a pattern and it would also be obvious at the time of applicant's invention to one of ordinary skill in the art to form a silicide composed of Ti, in which it is obvious at the time of applicant's invention to one of ordinary skill in the art that Ti silicide can be used as an etch stop material against a silicon etch. Further, it is well known in the art and would be obvious to employ an etch stop layer in an etch-back planarization process, as recited, as part of a conventional multilevel interconnect process to enable formation of interconnects and bond pads necessary to incorporate the disclosed device in an integrated circuit. It is well known to employ an etch stop over a structure that one would like to protect during an etching process so as not to overetch the structure, causing it damage. In addition, the use of photoresist is well known in the art as a means of patterning structures in the semiconductor industry and would be obvious to form the resist, as recited, as part of a conventional multilevel interconnect process to enable formation of interconnects and bond pads necessary to incorporate the disclosed device in an integrated circuit.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 38-45, 47-52, 54-59, 62-65, and 68-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nihira et al. (4,908,324). Nihira teaches forming first and second sections on a substrate, fig.8f, el.3 and 5, first and second Si plugs extending vertically, el.11, a field oxide in the second section, el.5, a first poly over the field oxide and portions over which the structure formed could be labeled, as recited in claim 40, for example, as consisting of "at least a portion of the second region", a second poly over the first poly and the first region, col.5, ln.61-67, forming no horizontal, but only vertical interfaces between the two poly structures, a gate oxide, el.6, patterning the plug region, col.5, ln.47-52, the second poly removed over the first poly, el.9 and 11, and doping the first and second poly structures, col.6, ln.4-6.

6. Nihira appears not to specify the use of resist over the poly plug, nor the use of As for doping the poly layers. Official notice is given that the use of photoresist is well known in the art as a means of patterning structures in the semiconductor industry and would be obvious to form the resist, as recited, as part of a conventional multilevel interconnect process to enable "en masse" formation of interconnects and bond pads necessary to cheaply incorporate the disclosed device in an integrated circuit. Official notice is also given that As is well known as a dopant and it would be obvious to switch

Art Unit: 2823

the dopant types of the structure to provide greater process and device latitude, such as by reducing dopant mobility with As, resulting in greater device lifetimes. Further it is also well known that As is an N-type dopant and would be obvious to those skilled in the art.

7. Nihira appears not to employ the use of an etch stop over the first poly. Official notice is given that it is well known in the art and would be obvious to employ an etch stop layer in an etch-back planarization process, as recited, as part of a conventional multilevel interconnect process to enable "en masse" formation of interconnects and bond pads necessary to cheaply incorporate the disclosed device in an integrated circuit. It is well known to employ an etch stop over a structure that one would like to protect during an etching process so as not to overetch the structure, causing it damage. Further, the use of Ti silicide as an etch stop material is also well known in the art and would be obvious to use in a conductive poly structure in order to both stop an etch and to further increase the conductivity of the structure.

Response to Arguments

8. Applicant's arguments filed 1/3/03 have been fully considered but they are not persuasive. Applicant argues that examiner's assertions regarding cited references in support of official notice is "unsupported by substantive law". Applicant's attention is directed to MPEP 2143, 2144.03, and *In re Zurko*, 258 F.3d 1379, 59 USPQ2d 1693 (Fed. Cir. 2001), where the conditions for the proper use of official notice in 103 rejections are clearly defined. The examiner's rejections and responses meet and

Art Unit: 2823

exceed the conditions for a proper "prima facie" case for a 103 rejection containing official notices. Applicant's arguments seem to focus around an assertion that there is a failure to provide a motivation to combine **references**, but in a 103 rejection employing official notice, it is proper to provide a motivation to combine the well known **element or process step, and not the supportive references**. The references cited are to support examiner's assertions as to what is well known in the art, see *In re Zurko*, and not intended to generate a new 103 rejection, which combines all the cited references. It is at the examiner's discretion as to which rejection to be applied, and not applicant's. Examiner has made a valid single reference 103 rejection supported with additional references, while applicant is ignoring the single reference 103 rejection and arguing against a multi reference 103 rejection, which examiner has never made. Applicant is not responding to the rejection the examiner **has** made, but rather to the rejection applicant thinks the examiner **should** make.

9. Applicant traverses examiner's rejection of claim 38 on the assertion that Nihira does not show or suggest a structure where the second poly overlies the first poly. Applicant is reminded that applicant has claimed an intermediate product and not a final product. Applicant's final product does not contain such a limitation either. Applicant's attention is directed to both fig. 8E and 8F, where the intermediate product in fig.8E does not have a second poly and the structure in fig.8F does. Further examination of Nihira, col.5, ln.61-67, clearly teaches how the second poly is formed. It is deposited as a conductive film and then etched back. Clearly, the deposited second poly film would overlie the first poly layer prior to the etch-back step.

10. Applicant traverses the set of claims 39, 40, 41, and 47, and the set of claims 42 and 43, on the grounds that Nihira does not teach the limitation discussed in applicant's traversal of claim 38, in addition to not showing the limitations of an etch stop layer nor the use of a photoresist mask. Applicant's attention is directed to examiner's response above to the claim 38 traversal. Further, the other limitations applicant identified, have already been identified as lacking and have been addressed in the 103 rejection. Applicant is not arguing the 103 rejection, but rather a 102 rejection, which has not been made.

11. Applicant traverses the 103 rejection of claim 45 on the grounds that Nihira does not teach a poly plug in the first region. Applicant is reminded that examiner must interpret the claims as broadly as reasonably possible, and the claim limitation regarding the first region is so broad that it can include everything except a portion of the oxide region, which is the second region. Since a portion of the poly plug, el.9, is not over the oxide, the poly plug can overlie the first region.

12. Applicant traverses claims 48-52, on the grounds that Nihira lacks an etch stop layer limitation and the same grounds for traversal as that of claim 45. Applicant's attention is directed to examiner's response above to the claim 45 traversal. Further, the other limitation applicant identified, has already been identified as lacking and has been addressed in the 103 rejection. Applicant is not arguing the 103 rejection, but rather a 102 rejection, which has not been made.

13. Applicant argues that the Nihira patent fails to contain all the claimed elements and therefore fails to establish a prima facie case of obviousness. Applicant had earlier

Art Unit: 2823

challenged Examiner's taking of Official Notice, in which Examiner has provided the required references, and applicant has acknowledged that the cited references do in fact contain the missing elements. By applicant's own admission, all the required elements for a prima facie case of obviousness has been established, see MPEP 2144.03. Applicant asserts that the cited references lack a motivation to combine. Applicant's attention is directed to each of the Official Notice statements, which contain motivational statements to modify the reference, see MPEP 2143. Please note that the rejection is based on the modification of a single reference and the other cited references are used to support examiner's assertion that such elements are well known in the art and are common knowledge to the skilled artisan. There is no requirement that these references must be combined to form a multi-reference 103 rejection, especially when the single reference 103 rejection is proper.

CONCLUSION

14. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2823


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neal Berezny whose telephone number is (703) 305-1481. The examiner can normally be reached on M-F 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

NB
March 28, 2003


Olik Chaudhuri
Supervisory Patent Examiner
Technology Center 2800